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Alternative Management Systems. Areawide Waste Treatment Management Plan for the Greater Houston Area (Section 208, P.L. 92-500)

Houston-Galveston Area Council, TX

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16. Abstracts This document is a continuing effort to develop and evaluate alternative management systems which will meet the needs of the FWPCAA, Section 208 project. Current Wastewater Management, May 1977, describes existing agencies; the Management Assessment, June 1977, assesses the current and future capabilities, authorities and limitations of the various agencies; and the Broad Management Options, July 1977, describes major approaches to meeting the management requirements.

The ten functional areas of management (as defined by the Management Assessment report, July 1977) have been reduced to five because certain functional areas are compatible with one another and could be performed by a single agency. They are:

I. Regulatory and Compliance Functions
II. Wastewater Treatment
III. Water Quality Planning
IV. Management and Coordination
V. Nonpoint Source Permitting and Regulation

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ALTERNATIVE MANAGEMENT SYSTEMS

NOVEMBER 1977

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ALTERNATIVE MANAGEMENT SYSTEMS

AREAWIDE WASTE TREATMENT MANAGEMENT PLAN
FOR THE
GREATER HOUSTON AREA
(SECTION 208, P.L. 92-500)

NOVEMBER 1977

PREPARED FOR THE HOUSTON-GALVESTON AREA COUNCIL
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TABLE OF CONTENTS

		Page
CHAPTER I	INTRODUCTION	I-1
CHAPTER II	WHY DO WE NEED A NEW WASTEWATER MANAGEMENT SYSTEM?	II-1
CHAPTER III	HOW WERE ALTERNATIVES DEVELOPED?	III-1
CHAPTER IV	WHAT FUNCTIONS WILL THE MANAGEMENT SYSTEM PERFORM?	IV-1
	Regulatory and Compliance Functions	IV-2
	Wastewater Treatment Functions	IV-4
	Water Quality Planning	IV-5
	Management and Coordination	IV-5
	Nonpoint Source Permitting and Regulation	IV-5
CHAPTER V	WHAT ARE THE ALTERNATIVES?	V-1
	Regulatory and Compliance Functions	V-1
	Wastewater Treatment	V-3
	Water Quality Planning	V-7
	Management and Coordination	V-10
	Nonpoint Source	V-12
APPENDIX A	CITIZENS' GOALS AND OBJECTIVES	A-1

CHAPTER I - INTRODUCTION

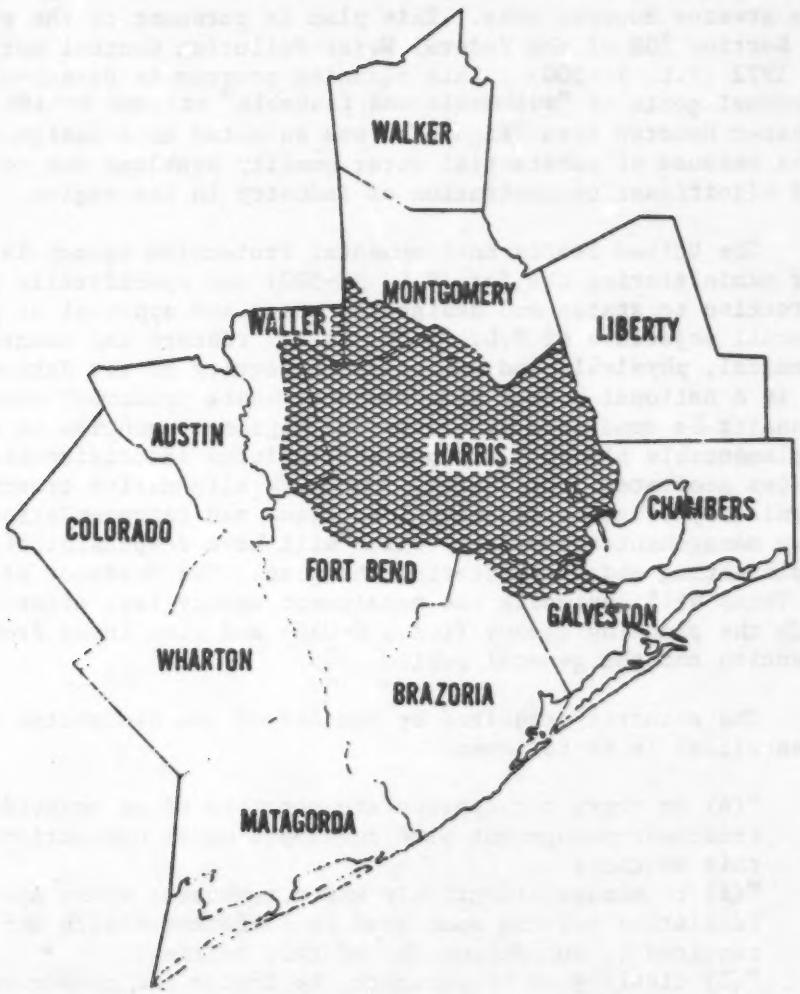
The Houston-Galveston Area Council (H-GAC) has been designated by the Governor of the State of Texas as the planning agency to develop a comprehensive areawide waste treatment management plan for the greater Houston area. This plan is pursuant to the requirements of Section 208 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500). This planning program is directed toward the national goals of "swimmable and fishable" streams by 1983. The greater Houston area (Figure 1) was selected as a designated area because of substantial water quality problems due to urbanization and significant concentration of industry in the region.

The United States Environmental Protection Agency is responsible for administering the Act (P.L. 92-500) and specifically provides direction to states and designated areas and approval of plans. The overall objective of P.L. 92-500 is to "restore and maintain the chemical, physical, and biological integrity of the Nation's water." It is a national policy that areawide waste treatment management planning be conducted by states and regional agencies to develop implementable plans. This process includes identification of all wastes generated in the areas, proposed alternative treatment systems, regulatory programs to control sources, and recommendation of alternative management agency(ies) which will have responsibilities for implementing and administering the plan. The Governor of the State of Texas will designate the management agency(ies) after consultation with the planning agency (i.e., H-GAC) and with input from affected local agencies and the general public.

The authority required by the Act of the designated management agency(ies) is as follows:

> "(A) to carry out appropriate portions of an areawide waste treatment management plan developed under subsection (b) of this section;
> "(B) to manage effectively waste treatment works and related facilities serving such area in conformance with any plan required by subsection (b) of this section;
> "(C) directly or by contract, to design and construct new works, and to operate and maintain new and existing works as required by any plan developed pursuant to subsection (b) of this section;
> "(D) to accept and utilize grants, or other funds from any source, for waste treatment management purposes;

FIGURE 1



GULF COAST STATE PLANNING AREA

Greater Houston 208 designated area

11/77

"(E) to raise revenues, including the assessment of waste treatment charges;
"(F) to incur short- and long-term indebtedness;
"(G) to assure in implementation of an areawide waste treatment management plan that each participating community pays its proportionate share of treatment costs;
"(H) to refuse to receive any wastes from any municipality or subdivision thereof, which does not comply with any provisions of an approved plan under this section applicable to such area;"

From the above direct requirements and other references, ten major functions regarding waste treatment management have been defined. They are:

- Planning
- Operations and maintenance
- Design and construction
- Finance
- Permitting and regulation (point source)
- Permitting and regulation (nonpoint source)
- Standard setting
- Enforcement
- Monitoring
- Management and coordination

The task at hand is to determine which agencies should have what functional responsibilities. Subsequent to this review and allocation of functional responsibilities, various technical, citizen, policy, and the H-GAC Executive Committee will review and recommend one management system for the State's review and certification. The Governor of the State of Texas will then designate the agency(ies) as the Management System.

CHAPTER II - WHY DO WE NEED A NEW WASTEWATER MANAGEMENT SYSTEM?

At the present time wastewater treatment is provided by a variety of entities from municipalities to special purpose districts. There are currently over 400 entities providing waste treatment services with their jurisdictional size ranging from development of several hundred acres to over 500 square miles for the City of Houston. This system has no overall coordination and, as a result, some functions are duplicated while others are not performed by any of the entities. There are portions of the region with excess capacity to treat wastes while other areas remain inadequately served. Figure 2 illustrates the present system as matched with the functional requirements of P.L. 92-500

FIGURE 2

	WASTEWATER TREATMENT - 208 FUNCTIONS									
	PLANNING	OPERATING AND MAINTAINING	DESIGNING AND CONSTRUCTING	FINANCING	PERMITTING AND REGULATING - (POINT SOURCE)	PERMITTING AND REGULATING - (NONPOINT SOURCE)	STANDARD SETTING	ENFORCING	MONITORING	MANAGING AND COORDINATING
ENVIRONMENTAL PROTECTION AGENCY				●	●		●	●	●	
TEXAS DEPARTMENT OF WATER RESOURCES	●			●	●		●	●	●	●
HOUSTON-GALVESTON AREA COUNCIL	●									●
GULF COAST WASTE DISPOSAL AUTHORITY	●	●	●	●						●
RIVER AUTHORITIES	●	●	●	●						●
LOCAL GOVERNMENT (CITIES, COUNTIES)	●	●	●	●		●				●
CITY OF HOUSTON	●	●	●	●		●		●	●	●
WATER DISTRICTS	●	●	●	●				●	●	●

● MAJOR RESPONSIBILITY
● LIMITED RESPONSIBILITY

The designated area, therefore, does not presently have a management system that meets the requirements of Section 208 of the Federal Water Pollution Control Act Amendments of 1972 (FWPCAA) and as a result cannot comply with the federal mandate under the law. For this reason the region has embarked upon a program to recommend a structure for waste treatment management that will conform to the requirements of federal law. This will enable the region to continue to participate in federal funding programs which can provide 75 percent of the capital costs of wastewater treatment facilities while moving toward attaining water quality goals.

The major objective of this activity was to develop and evaluate alternative management systems which would meet the needs of the 208 program.

CHAPTER III - HOW WERE ALTERNATIVES DEVELOPED?

The development of alternative management systems began with an analysis of existing agencies and the requirements of P.L. 92-500. A description of the existing agencies involved in wastewater management was documented in a report titled Current Wastewater Management, May, 1977. This report provided detailed information regarding the present authority and activities of federal, state, regional, and local agencies. The information was organized according to functions required by the Act to facilitate ease of understanding and correlation to new or expanded roles by agencies.

The second major report issued was the Management Assessment report, June, 1977. In this report the current and future capabilities, authorities, and limitations of the various agencies regarding the performance of required Section 208 functions was assessed. Performance and capabilities were assessed using five evaluation factors (legal, financial, technical/administrative, public accountability, and political acceptability). Key interviews, survey questionnaires, and group meetings with agencies having potentially major roles in the future 208 management agency were used as sources of information.

A Broad Management Options report, July, 1977, was developed which described major approaches to meeting the management requirements of P.L. 92-500. The object in developing these broad options was to generate ideas and points of view from the various advisory committees that would enable the project team to define more specific management alternatives. Four distinct options were identified. They were as follows:

1. The State-Centered Approach which would generally assign the Texas Department of Water Resources (TDWR) (formerly TWQB) with responsibility for most functions except the day-to-day operation of treatment facilities. Local or regional Treatment Works Management Agencies (TWMAs) would operate designated facilities. The TWMAs would finance, construct, own, and operate wastewater treatment facilities at the direction of the Texas Department of Water Resources.

2. In the Regional Concept, a single regional entity would be assigned to meet the identified functional requirements of the Act. Unlike the State-centered option, the focus for authority and control would be placed within the region (the designated area). Candidate agencies that could be viewed as having a number of the necessary

regional management characteristics are: Houston-Galveston Area Council, Gulf Coast Waste Disposal Authority, San Jacinto River Authority, and the City of Houston.

3. The Watershed-Based Concept would place primary operating and management responsibility with the major municipalities and would create master districts for watershed areas outside existing municipal boundaries. To the extent that existing municipal boundaries overlap natural watershed boundaries, the watershed district might not have jurisdiction over the entire physical watershed. The approach, under this concept, is to focus wastewater management on a stream and its drainage boundaries.

4. The Coordinated Public System would basically formalize and coordinate the present system with a strong focus on consolidation. Inherent in this option is the consolidation of the wastewater treatment function of small districts into a few large districts with regional treatment systems. The most apparent problem with the multiple-agency coordinated public system is that it requires a considerable degree of cooperation among the various participating entities. In the absence of a strong management and coordination function, the multiple entity approach would likely suffer discordance.

Throughout the project, coordination and contact has been maintained with the H-GAC staff and the consultants responsible for preparing the technical aspects of the 208 plan. Coordination meetings were conducted to exchange and compare management and technical subplan preliminary findings and to determine the compatibility of findings in relation to the management aspects of the plan. Generally, the broad options and management alternatives are compatible with technical strategies that are being considered to abate water pollution. Continuing coordination will be maintained until the management and technical plans are submitted to the Governor.

Coordination has also been maintained with representatives of citizens groups. The Citizens' Goals and Objectives report, June, 1976, provided input in the evaluation of broad management options. Appendix A contains the statements of citizens' goals and objectives which were developed during a series of public workshops and meetings. In general, the broad options and the management alternatives satisfy many of the general goals and objectives. Some objectives are so specific that their adoption cannot be decided until the program implementation activities are initiated, for example, Goal 1, Item g., "providing for citizen petition to remove board members."

CHAPTER IV - WHAT FUNCTIONS WILL THE MANAGEMENT SYSTEM PERFORM?

From a review of Section 208 of P.L. 92-500 and applicable State and federal regulations, it was determined that ten (10) management functions must be addressed in any management plan. A short summary of each function is presented below. A more expanded definition of each of these functions may be found in Management Assessment Report, July, 1977.

1. Planning: All aspects regarding water quality within the designated area will be analyzed and reviewed, and these water quality concerns must be integrated with other areawide subjects such as air quality, transportation, etc. Detailed planning for wastewater facilities such as 201 planning is not included within this comprehensive planning function.

2. Design and Construction: Wastewater treatment facilities must be designed and built. Planning related to the specific location, size, and type of facilities would be included in this functional area.

3. Operation and Maintenance: Wastewater treatment facilities must be operated and maintained to ensure that effluent is of the required quality and that residuals are properly disposed.

4. Finance: Funds must be obtained to pay for the development of wastewater treatment facilities and revenue obtained for their operation and maintenance.

5. Permitting and Regulation, Point Sources: Each point source must be regulated with respect to effluent discharge standards and existing stream quality.

6. Permitting and Regulation, Nonpoint Sources: Depending upon the results of technical studies, nonpoint water pollution sources may need to be regulated with respect to discharge and resultant stream quality.

7. Standard Setting: The measures of desired stream quality and effluent quality must be legally adopted after public input.

8. Enforcement: Legally adopted discharge standards must be met by the discharger. Prosecution of violations is essential in achieving the clean water objectives.

9. Monitoring: The quality of water in the streams and the quality of discharged effluent must be sampled and chemically analyzed to determine if standards are being met.

10. Management/Coordination: All of the elements identified above must be implemented, and the implementation agreements and provisions must be overseen by a manager/coordinator. This manager/coordinator would be the policy-making entity for the 208 designated area and would recommend action priorities, measure progress, determine and develop continuing programs.

These ten functional areas are to be assigned to and performed by one or more agencies. To further aid this allocation process, the following groupings of functions have been developed because certain functional areas are compatible with one another and could be performed by a single agency. There are five groups of functions which include all the functional requirements previously defined.

I. REGULATORY AND COMPLIANCE FUNCTIONS: Existing statutes and basin planning activities have vested certain functions with the State (often concurrently with the federal government). These functions are (1) permitting of point sources; (2) standard setting; (3) monitoring; and (4) enforcement.

Permitting

The Texas Department of Water Resources in concert with EPA issues permits for wastewater discharges. The decision to issue a discharge permit and the conditions of the permit are related to existing stream quality and the waste load allocations possible to meet stream standards.

Standard Setting

The powers to establish and maintain discharge and stream standards are closely related and statutorily allocated to the Texas Department of Water Resources in concert with EPA.

The power to establish stream standards was clearly allocated to the State under the recent Texas Water Resources Act (HB 1139, 1977). These stream standards are to be developed with input from affected localities, based on recommended uses of the water.

Discharge standards are to be developed and codified by the State. However, the State discharge standards must, at a minimum, meet the federal discharge standards established under P.L. 92-500.

More stringent discharge standards may be required by the State, but the State cannot weaken the federal minimum requirements.

The decision to issue a discharge permit and the conditions of the permit are related to the stream standards and existing stream quality. Permitting of point sources is clearly vested in both federal and state agencies; although the State takes the primary role.

Therefore, the establishment of stream standards, discharge standards, and permit issuance are highly intertwined, and these functions are already allocated.

Monitoring

The State also has been given roles with regard to monitoring of stream quality, monitoring of discharge quality, and enforcement of permit violations. Unlike permitting and standard setting, however, these State roles are not exclusive roles. Instead, these roles are shared with other entities.

The monitoring of stream water quality is an important function. Stream standard compliance must be determined in a uniform manner on larger water bodies throughout the state, and the State has the money to implement this monitoring. However, more detailed stream monitoring may be desirable locally. Therefore, while the State role is established and ongoing, the role does not preclude other entities from participating.

The monitoring of discharge standards is undertaken by the State as well as other entities. Wastewater monitoring is primarily the responsibility of the discharger, with the data being compiled centrally by the State. Spot checks regarding effluent quality are undertaken by the State, and local governments also may be active in this area.

Enforcement

Enforcement is directly related to monitoring. If stream quality declines, more active point source discharge monitoring and enforcement may be required. Certainly, monitoring of discharge quality and violations of discharge permits is directly related to enforcement. The State has established the Attorney General's Office to pursue remedies for violation of State law, and the Attorney General's Office has established an Environmental Protection Division. However, the Attorney General's Office may not sue a violator unless specifically requested by the State agency.

Therefore, while an ongoing role has been established at the State level, other levels of government are not precluded from these activities. Indeed, their participation (if not duplicative) may be desirable.

II. WASTEWATER TREATMENT FUNCTIONS: Three of the ten functional areas are directly related to wastewater treatment. These three functions are (1) design and construction, (2) operation and maintenance, and (3) finance. Traditionally all of these statutes have recognized the proper interrelationship of design, finance and operation, and thus these functions can be easily administered together. Moreover the staffing and expertise of treatment agencies seem particularly geared toward handling all three functional tasks. Tradition, statutory authority, staff composition and simple practicality all seem therefore to point to formal grouping of these functions.

Future interrelationships will be even more pronounced. Under Section 208, operators of wastewater facilities can require pretreatment of certain wastes and assess the proportional share of the facility operating costs to users of the system. To separate revenue gathering from system operation would unnecessarily complicate an otherwise straightforward relationship.

Further, system design may have profound impacts upon system costs. For example, excessive energy or materials consumption can lead to higher operating costs, and advanced wastewater treatment systems will require greater initial and operating capital investments. While the design parameters could be controlled by either the planning or the management functions per se, the entity required to raise the revenue and operate the facilities should have the right to oversee aspects relating to the exhaustion of those revenues.

Similarly, operation and maintenance of a facility will impact system costs. If a system is not properly operated, permit parameters may be violated. Fines resulting from such violations must be paid from revenues raised within the system. Inadequate operation may also lead to excessive materials and energy costs, again exhausting monetary resources.

Therefore, substantial arguments exist for grouping design and construction, operating and maintenance, and finance. However, this functional grouping does not address nor limit options concerning the number or geographic coverage of entities which may be vested with the three wastewater treatment functions. It only indicates that any entity given one of these functions should also be given the other two functions.

III. WATER QUALITY PLANNING:
IV. MANAGEMENT/COORDINATION:
V. NONPOINT SOURCE PERMITTING AND REGULATION:

The three remaining functions -- water quality planning, management and coordination, and nonpoint source permitting and regulation -- may be considered rather independently. In other words, interdependencies exist between these functions and other functional areas, but no overriding practical or theoretical considerations would require them to be grouped from a functional standpoint. Therefore, these three duties could be allocated in three different ways.

From a practical standpoint, one may argue that the water quality planning function and the management and coordination function should be allocated to the same entity. Certainly 208 planning will result in recommendations that the management and coordination function must implement At the same time, management and coordination's practical posture should be able to influence planning's recommendations to some degree. On the other hand, having both functions vested in the same body may dilute the planning function's objectivity. The important point is while both functions should perhaps be ultimately allocated to the same agency, sufficient contrary argument exists to discourage such a grouping at this point in the analytical process.

Nonpoint source control is clearly severable, particularly from the standpoint of past experience and existing legal authority. In addition, much more needs to be learned about nonpoint source problems before a control program could or should be linked to any of the other management functions. For example, it may ultimately be shown that nonpoint controls should be most closely tied to point source permitting. Alternatively the key link may be to drainage and related flood controls. It could well be that nonpoint source controls simply will not prove critical enough to the various technical solutions to warrant any kind of nonpoint program at all. Nonpoint source programs may thus need to be no more than an extension of current local practices but could conceivably require new legislation and the increased involvement of a broadly based 208 management agency. Until these uncertainties are resolved, nonpoint source programming should be viewed as a separate water quality concern.

In summary, the ten functional areas have been reduced to five groups. These are:

I. Regulatory and Compliance Functions
   (a) Permitting
   (b) Standard setting
   (c) Monitoring
   (d) Enforcement

II. Wastewater Treatment
    (a) Design and construction
    (b) Operation and maintenance
    (c) Finance
III. Water Quality Planning
IV. Management and Coordination
V. Nonpoint Source Permitting and Regulation

CHAPTER V - WHAT ARE THE ALTERNATIVES?

The assignment of responsibility for the five functional groups discussed above will define the alternatives for the decision-making process by the Executive Committee of H-GAC.

I. REGULATORY/COMPLIANCE FUNCTIONS:

Four of the basic ten management functions have been grouped under the State responsibility. They are: permitting and regulation of point sources, standard setting, enforcement, and monitoring. While the reasons vary, it is clear that these functions are at present and will be in the future primarily State responsibilities.

Permitting and Regulation of Point Sources

Both by tradition and federal mandate, this function is to continue to be a responsibility of the Texas Department of Water Resources. While federal participation in this process, because of the nature of the NPDES Process, will continue, the major staffing and major responsibility will continue to lie within the new Department of Water Resources. Under this management function, there is in fact no significant role to be allocated beyond the State and federal level. There is, therefore, no reason to speculate about other alternative ways of allocating this responsibility.

Standard Setting

Standard setting, similarly, has a clear conceptual basis and a clear line of authority leading to the State. The establishment of both stream and effluent standards by the State, with the cooperative participation of the federal government, is expected to continue. Clear support for this allocation lies in the legislation creating the consolidated water agency. This act, H.B. 1139, states unequivocally that the responsibility for standard setting shall lie within the new Texas Department of Water Resources. In fact, there is no mention within the new Texas Department of Water Resources. In fact, there is no mention within the existing legislation of local participation.

Monitoring

The third management function should be the primary responsibility of the State. The monitoring function is different from the monitoring which is the normal day-to-day activity of the wastewater treatment plant operator. Monitoring from the 208 management perspective encompasses the broader stream and effluent monitoring that

is related most directly to enforcement activities. It is the safeguard in the 208 process and in the State's ability to meet the water quality goals that it has set through legally adopted standards. There is clearly a significant difference between the two types of monitoring, and for that reason, monitoring by the treatment operator comes under the category of operating and maintaining facilities to be discussed later. The reasons for allocating comprehensive monitoring responsibility to the State stems from both the State's existing monitoring activities and its legal authority in this area. In addition, and no doubt of equal importance, is the State's ability to finance and staff monitoring activities on a statewide basis. While the primary allocation of this responsibility to the State appears to be the most logical allocation, a desire has often been expressed to improve coordination among other existing local monitoring agencies which are and may be part of the total process. This desire can be effectuated so long as the State retains the ability to coordinate and supervise the more localized efforts.

Enforcement

The fourth management responsibility within the State functional group is enforcement. Since the State will be responsible for permitting, standard setting, and monitoring, these activities logically lead to an enforcement role. Similarly, an enforcement role at the State level is logical because of the powers within the State; the staff that the State has through the Attorney General's Office; and finally because the State, being somewhat detached from the local scene, has a unique vantage point from which to enforce the adopted water quality standards. The nature of enforcement as envisioned is quite broad. It varies from traditional persuasion and legal action to the as yet untested enforcement process through which facility plans are reviewed in terms of their conformance to the adopted 208 plan and the State's overall water quality goals. While enforcement responsibility has been lodged primarily within the State, it cannot be an exclusive authority. This clustering and allocation process does not in any way mean to negate the responsibility for enforcement activity that would remain within other local and regional bodies. Following the selection of the preferred management alternative, this relationship between local and State enforcement activity must be clarified. However, the major responsibility should lie within the State for the reasons that have been already stated.

Alternatives

There do not seem to be any feasible alternatives to the continuation of State responsibilities in this area. Further study during implementation planning should be conducted, however, to determine the extent of local participation in the monitoring and enforcement functions.

II. WASTEWATER TREATMENT:

Discussion

Three of the ten basic management functions have been grouped under the wastewater treatment cluster. These are operations and maintenance, design and construction, and finance. It should be noted that these functions relate to sewage treatment facilities. As such, planning for facilities as in Section 201 planning would be part of this function. Finance encompasses the activities necessary to obtain revenues for the construction and operation of facilities. In this regard a management designation does not negate the continued role of the federal and State governments in providing financial assistance for construction of waste treatment facilities.

There are three management alternatives that have been identified as appropriate to assume the responsibilities required to perform the functions assigned to the operating cluster. Thus, the first major decision point is which of three alternatives will be selected as the preferred management alternative. For the sake of analysis, the three options have been titled:

(1) Present System Continued
(2) Consolidated Operating System
(3) Water Basin System

Alternatives

Presented below are discussions of each of the three operating alternatives from which a selection is to be made.

(1) Present System Continued

The Present System Continued is one in which there are many public and private participants, all operating within the Greater Houston area. This alternative would include not only existing waste treatment operators but would allow for the continued formation of new districts to treat wastewater in growth areas.

Continuation of the present system for operation-oriented functions would require extensive management/coordination to assure the achievement of water quality consistent with the 208 plan. There are currently close to 400 entities in the 208 area involved in wastewater treatment.

From the standpoint of the technical solutions to water quality problems the present system continued may not be

considered the best choice. The boundaries of most entities treating water are not established along natural drainage or watercourse patterns. From an engineering perspective, a great multiplicity of agencies provides a complex technical and financial challenge. With so many agencies involved it is almost impossible to conceive a system in which future costs could be distributed in a proportional manner. In addition, the continued operation of numerous small plants creates an ongoing need for full-time operators that cannot perhaps be satisfied. This alternative needs to be considered nonetheless since it would involve the least change and disruption in existing structures. With the addition of a system for coordinating plans and actions of the various participants, continuation of the present system is feasible. However coordination of such a large group will be difficult to establish, particularly when an increased but unified local effort is desired (e.g., in the area of monitoring).

(2) Consolidated Operating System

The Consolidated Operating System envisions the continued operation of large systems with consolidation of smaller operations. It would discourage the establishment of additional small service districts for waste treatment. The objective of this system would be to limit the number of operating agencies to approximately 50. In the consolidated alternative, the Gulf Coast Waste Disposal Authority would concentrate its efforts in the industrial area and provide limited service in the municipal treatment area where it is technically and economically feasible. The City of Houston would continue operating as it does today, providing service within its own limits and eventually within the area that would be annexed to the existing city. The City would also strengthen its review powers within their extraterritorial jurisdiction (ETJ) in order to encourage further consolidation and development of regional facilities. Other cities such as Baytown and Pasadena, which have large operating facilities, would continue to provide services within their present service area boundaries. Under the consolidation approach, the many special and water districts would be encouraged to consolidate the management of their operations into larger districts for the purposes of wastewater treatment. More extensive use of service by contract would also be encouraged.

While recognizing that special districts provide a wide variety of services beyond wastewater treatment, the 208 plan has been limited in its scope to water quality issues. Thus, while

consolidation for other services might be logical, this alternative calls only for the consolidation of districts' wastewater treatment activites. The development of new districts would also be reviewed in such a way as to further the consolidation approach and the creation of fewer and larger districts.

(3) Water Basin System

This operating alternative is based on the establishment of large special districts conforming generally to natural watersheds. The Water Basin System rests upon the technical desire for a reduction in the number of operating agencies. The system suggests that consolidated responsibility could result in improved water quality achieved on a cost effective basis through a more efficient management approach. Under this approach Gulf Coast Waste Disposal Authority would concentrate its efforts in industrial treatment and the City of Houston would continue to operate as it is in the present structure. In addition, larger cities such as Baytown and Pasadena would continue to provide service within their technically appropriate service areas. Such an approach acknowledges the fact that different basins and watercourses have different needs and problems to be confronted.

The major change would occur at the level of the special districts and water districts. After the evaluation of the technical subplans and further analysis of the technical impact of the studies that have been undertaken so far, a limited number of larger water basin districts would be identified. Many of the others would be consolidated into a limited number (approximately five) of watershed basin districts. In summary, the larger entities now in the treatment business would continue to function, but the growing areas outside the service areas of these agencies would be developed on a consolidated basis with an extremely limited number of large basin districts.

Advantages and Disadvantages

There are three clear operating alternatives to be decided among: (1) a continuation of the present system; (2) a limited consolidation of treatment agencies with only large scale sewage treatment districts being created and service contract arrangements being encouraged; and (3) a more extensive consolidation along basin lines with continued operation and maintenance by those who are presently the larger operators.

Certain advantages and disadvantages must be recognized with each of the alternatives. Under the present system, the continuation

of hundreds of agencies would, in fact, not only present an administrative and efficiency problem, but also a real implementation hurdle for the 208 plan. From an engineering standpoint, the best route to water quality is through a limited number of operating agencies. In fact, it has been stated on occasion that the preferred system from an engineering standpoint would have one operating agency. While the present system option could, with a great deal of management coordination, serve the region as it has in the past, its disadvantages are many.

The consolidated approach moves in the right direction and, in fact, may be an interim step toward a more unified management system for the region. The advantages of the consolidated approach are that it relies upon the strengths of some of the existing agencies. For example, the industrial capability of Gulf Coast is recognized and built upon in this alternative as is the importance of the large system maintained and projected into the future by the City of Houston. It does, through its flexibility, allow for the continued development and creation of special purposes districts, which in the Houston area have been traditional mechanisms for the development of new areas. The major disadvantage of the consolidated approach is that it may not go far enough. The technical problems associated with having numerous agencies in the wastewater treatment business remain.

Management and coordination within this consolidated system could prove difficult. While the number of agencies directly impacting upon water quality has been significantly reduced versus the present structure, there still are numerous agencies involved with water quality.

A problem that cannot be avoided in both the consolidated and water basin approach is the difficulty of moving from the numerous agencies presently operating to a reduced number. While the process of consolidation can be hypothesized, the details remain to be worked out. Where appropriate, modular facilities, for example, could be built and taken over at a later date by a larger annexing authority. There has also been discussion suggesting a phase-out concept where State-approved interim plants will be built that, at a later date, can easily be assimilated into the larger districts. The financial arrangements that will have to be made for consolidation of facilities within districts could take several forms. Efforts will need to be made to develop a process which is financially equitable. Regardless of the range of problems associated with consolidation, it is clear that the 208 planning process, both from the management and technical standpoint, tends toward the regionalization of facilities and thus a reduction in the number of operating entities.

The watershed basin approach has many of the same problems and inherent possibilities of the consolidated approach. Since it is more extreme in both regionalization of facilities and in reduction

in the number of operating agents, it does provide an attractive management alternative. However, from the standpoint of implementation, it is a difficult alternative. The conceptualized watershed basin district does not exist under present legal authority. To create the range of powers required for such a basin authority would probably require State action and the creation of the districts by new legislation especially tailored to the particular needs of local water quality management. While this is not an insurmountable obstacle, it is, nevertheless, a problem that would have to be specifically addressed.

There has been a growing awareness during the course of the 208 study of the need for further consolidation of management authority in the operating area. Consolidation is important both because of water quality and because of the efficiencies of large-scale operating functions. The fact is that, given the exact same water quality goals for the region, it is believed that a consolidated approach can produce a system which is both more equitable and is less costly to the individual homeowner than the continued fragmented system. There will be costs to the public regardless of the management system, and it appears that the most equitable and logical allocation of those costs can best occur within a system which allows for a greater consolidation of management authority.

III. WATER QUALITY PLANNING:

Discussion

It is important to understand what this water quality planning function is and what it is not. It is not 201 facilities planning which was discussed as part of the design and construction process. In addition, it is not the kind of statewide planning that would, regardless of the selection of a 208 management alternative, remain within the Texas Department of Water Resources. What is being talked about as a planning role is long-range regional comprehensive water quality planning. It is planning that looks to water quality goals and development impacts and reflects local desires through annual updates of the 208 waste treatment management plan. Further it seeks to coordinate water quality planning with the regions comprehensive plan. Given this definition of planning, there are a limited number of alternative agencies from which to select. The alternatives are as follows:

(1) The State -- The Texas Department of Water Resources
(2) The Houston-Galveston Area Council (H-GAC)
(3) The Houston Areawide Water Quality Coordinating Board

(1) The State -- The Texas Department of Water Resources

The State, through the Department of Water Resources, could provide planning services for the Houston area much as it has done for the nondesignated 208 areas within the state. This could be accomplished either with the State's existing staff or on a contract basis with regional agencies such as H-GAC, GCWDA, or the City of Houston. However, the major responsibility for the preparation of the annual updates and the projections of the impact of various development and environmental factors upon water quality would, regardless of the operating procedure, rest with the State.

The State approach has a number of advantages. Clearly, the State has ongoing funding and a staff which is experienced in water quality affairs. In addition, it has a long-range, broad view of the State's needs and can bring those long-range views to bear upon the region's problems. Through its predecessor departments, it has many years of experience in dealing with water quality problems and coordinating with EPA. Yet citizen input to date have shown a desire to keep as many of the 208 management functions within the region as is possible, and delegating this authority to the State could run into opposition for that reason. Another factor is that the State has many other responsibilities, and there is some question whether the State is interested in being charged with the specific responsibilities required of a planner for the Greater Houston area.

(2) The Houston-Galveston Area Council

The second alternative envisions the H-GAC continuing to provide planning services related to water quality. Following the completion of the 208 plan, H-GAC would be designated as the continuing regional water quality planner and would, on the basis of funds it receives continue to provide planning services related to water quality. In addition to the funding that may be forthcoming from EPA as part of its continuing 208 program, H-GAC could secure additional funding from local public agencies that would benefit from the regional water quality plan and provide critical inputs into the plan. H-GAC would maintain a staff and appropriate facilities to provide this kind of ongoing planning service.

H-GAC's potential role as the continuing 208 planner can be clearly understood at this time because it has provided such services as part of the 208 program. Major administrative problems have already been worked out between the State and EPA, and H-GAC has a special coordinating and planning

presence within the region. Moreover, it has worked with the various local governmental entities within the designated 208 area. A major problem for the continued planning operations within H-GAC structure is the lack of clarity as to continued funding for planning activities related to water quality. While there has been a great deal of discussion at the federal level regarding continuation of the program it is not assured as of yet. Thus, if H-GAC is to continue to provide planning services beyond its 208 responsibilities, a means of securing financing for this activity must be found. H-GAC responsibility for the planning function would be a logical extension of the role that is already being performed and thus would provide for less management dislocation in the planning process than would occur if either of the other alternatives were pursued. Coincident with water quality concerns are those related to solid waste, transportation, and housing. H-GAC is a logical vehicle for such environmental concerns and the agency is expected to provide long-range planning services for dealing with these problems in the future.

(3) Houston Areawide Water Quality Coordinating Board

The third alternative is the designation of a new coordinating body as water quality planner for the region. This board would consist of all participants in the management system including the State, City of Houston, GCWDA, H-GAC, other major operators, as well as EPA. While more will be said about the role of the coordinating body under the management and coordination section, such a body could be responsible for planning services. This agency would provide the kind of planning services required for the annual updates and evaluations of the region's 208 program, either through contract with existing public agencies ranging from H-GAC to the cities or through consultants. The financing for such planning would be much the same as the previous alternative, although more difficult to achieve since a new organization would initially lack the existing support of federal funding.

Advantages and Disadvantages

In all three cases, the option to subcontract portions of the planning work would be available. In addition, in all three cases, coordination of planning activities would be required with both public and private participants in the region. The important point is that one of the three management agencies, be it the State, H-GAC, or the coordinating board, would be officially charged with the responsibility of the annual updates and undertaking the ongoing planning services required to meet the region's water quality needs.

IV. MANAGEMENT AND COORDINATION FUNCTION:

Discussion

The alternative agencies for management and coordination are the same agencies as those discussed for planning. The management and coordination agency, in addition to providing a series of linkages between various operating agencies within the region, will also be responsible for policy decisions and coordinating the region's response to both the State and federal governments. It will be the major agency reviewing and directing the region's own progress toward meeting the 208 goals. While both the State and federal governments will have particular authorities and overview responsibilities in this regard, it will really be the management and coordination agency that will, if functioning correctly, move the region toward the full implementation of its 208 plan. It will also be the forum for policy discussions and discussions dealing with the problems of implementation and consolidation and provide an ongoing mechanism for citizen participation. While these functions and powers of the coordinating agency are varied and not as specific as they should be, it is apparent that the selection of this part of the management system is a most critical selection. The three alternatives for Management and Coordination are:

(1) The State -- Texas Department of Water Resources
(2) Houston-Galveston Area Council (H-GAC)
(3) Houston Areawide Water Quality Coordinating Board

(1) The State -- The Texas Department of Water Resources

The State, because of its unique powers as granted through the new Texas Department of Water Resources legislation and its traditional concern for water quality issues, could be responsible for overall management and coordination. It would require neither new legislation, new financing, nor major staff additions. In addition, the State has provided coordination and assistance in 208 planning in the designated as well as non-designated areas.

(2) The Houston-Galveston Area Council

H-GAC has developed an established procedure for management/coordination as part of the 208 project. It has elected officials serving on its Executive Committee, who are to some extent responsible directly to the public, and has an advisory committee structure which provides the Executive Committee with technical and policy inputs on water quality issues. In addition H-GAC has a staff that has gained considerable experience in 208 planning while continuing to bridge the gap between public supervision and local programs in ongoing efforts such as

the A-95 review process. H-GAC has developed a procedure which is responsive to both political realities and to technical inputs, a procedure which could be furthered beyond the 208 planning process.

H-GAC however also has particular problems. H-GAC does not have special funding to provide a management and coordinating role. H-GAC itself does not have the statutory authority needed to enforce its management and coordination decisions and thus must rely on voluntary compliance.

(3) Houston Areawide Water Quality Coordinating Board

The coordinating board concept is one which would require the creation of a new agency to serve as a forum in which disputes between various management entities could be resolved. The board would seek to attract the key decision-makers throughout the Greater Houston area so that a meaningful dialogue and review of alternative plans could lead to successful implementation of the 208 program. The development of a group that would have representation from all the local and regional water quality actors, as well as the Texas Department of Water Resources and EPA, is certainly within the realm of possibility. Such a board could be created, most likely without any new legislation, through the interagency agreement power that already exists at the local and regional level. Participation of State and federal officials would be automatic and not at all difficult to achieve. The major disadvantage of this new coordinating board is that, while it would have a specific focus on water quality, its very creation presents the region with a necessity of yet another management agency. It would be an agency which would perhaps need to be tied in some way to an existing agency such as H-GAC in order to overcome some of the funding, staffing, and credibility problems that could beset a new and totally independent entity.

Advantages and Disadvantages

Participants in the study have stated on numerous occasions that they would like to see local control retained for critical functions wherever possible. Management/coordination is clearly one of those critical functions that could be retained within the region. Because of the obvious lack of local control, the State management approach is less supportable. Nevertheless, the State will and must participate to some degree within the management and coordination structure that is to be established regardless of the alternative finally chosen. An advantage of the coordinating board is that it would make its own decisions. If the State were the

management/coordination agency, it would undoubtedly utilize a local or regional review body or citizens group that would report to the State. If H-GAC were the management/coordination agency, it would follow 208 precedent and probably create a water quality committee that would in turn report to its executive committee of elected officials; thus, there would be a two-step decision-making process.

There is a logical link between the planning function and the management and coordination function. While one agency could be selected to do 208 planning and another management/coordination, it would appear that there is justification for clustering these functions, thereby suggesting the same alternative be chosen for both.

There are, therefore, three clear choices — the State, H-GAC, and the coordinating board. They all have advantages and disadvantages; but when one defines the management and coordination role and determines the degree of authority and local control that is required as well as the efficiencies that are looked for, the choices become highlighted, and a decision can be made.

V. NONPOINT SOURCE FUNCTION:

Throughout the management planning analysis process, there has been a basic management function known as permitting and regulation of nonpoint sources. Because of the interface with the technical material to date, a decision on the management component of the nonpoint source issue has to be in some manner deferred. It is clear at this point that the major enforcement power for the variety of nonstructural controls over erosion, urban runoff, etc., will remain with local government. Counties, for example, can do a great deal to improve water quality via their flood control powers as has been demonstrated in the nonpoint source analysis performed as a component of the 208 planning process. The City of Houston and other municipalities should strengthen their review process and develop ordinances to control nonpoint source pollution through their existing subdivision approval process. However, because the technical analysis has, at this point, not clearly demonstrated the extent and nature of the nonpoint source programs needed in the region, it seems premature to attempt to resolve the nonpoint source management issues.

What is being recommended, therefore, regarding nonpoint sources, is that all efforts be made to utilize current available authority in enforcement of existing ordinances. The nonpoint source problems must be further defined through planning work by the chosen planning body. A monitoring program which would be jointly developed by the

State and the Houston area to test the success of its implementation and enforcement program over nonpoint source problems would have to be developed. As problems are identified, the designated management/coordination agency should also provide assistance in nonstructural controls to those local agencies that are charged with enforcement. Such assistance would include the development of draft ordinances and the dissemination of information to local agencies. Thus, what is being recommended at this time is an interim program consisting of short-term use of existing controls and long-range reliance upon the future planning and management/coordination program. The responsible 208 agency would see to it that once the technical problems are more clearly identified, responsive solutions are developed.

MANAGEMENT ALTERNATIVES

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1. REGULATORY & COMPLIANCE

   Permitting
   Monitoring
   Standards
   Enforcement

   ___ Texas Department of Water Resources (TDWR)

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2. PLANNING

   ___ TDWR

   ___ H-GAC

   ___ Water Quality Council

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3. WASTEWATER TREATMENT

   Operations & Maintenance
   Design & Construction
   Finance

   ___ Present System Continued

   ___ Consolidated Operating System

   ___ Water Basin System

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4. NONPOINT SOURCE CONTROL

   Sampling/Special Studies
   Technical Assistance
   Enforcement

   ___ Existing Authorities

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5. MANAGEMENT/COORDINATION

   ___ TDWR

   ___ H-GAC

   ___ Water Quality Council

APPENDIX A

CITIZENS' GOALS AND OBJECTIVES

These are the goals adopted by the Citizens Advisory Group determined as a result of a series of workshops.

GOALS AND OBJECTIVES

FOR THE GREATER HOUSTON AREA 208 PROGRAM*

THE OVERALL GOAL OF THE GREATER HOUSTON AREA 208 PROGRAM IS TO ELIMINATE THE DISCHARGE OF POLLUTANTS INTO THE WATER RESOURCES OF THE AREA BY 1985, WITH PARTICULAR ATTENTION TO:

A. Preserving and protecting the quality of groundwater resources.
B. Preventing further degradation of bodies of water.
C. Assuring that efforts to improve water quality take into account special problems posed by the existing uses of various bodies of water.
D. Attaining and maintaining water quality commensurate with the protection, propagation, and human consumption of finfish, shellfish, and wildlife native to the area.
E. Attaining and maintaining water quality that allows for recreation in and on the water.
F. Attaining and maintaining drinkable water in as many bodies of surface water as technically, economically, and naturally possible.

The attainment of the desired level of water quality in the Greater Houston 208 Area is closely linked to the achievement of the following specific goals and objectives, which are:

1. To develop an efficient, economical, responsible, and publicly accountable institutional arrangement for managing water resources by:

a. maintaining a vigilant liaison program with the technical community;
b. requiring consideration of the environmental consequences of management decisions;
c. coordinating all water quality programs;
d. reducing the number of overlapping authorities;
e. providing for, encouraging and assisting public participation in the management process;
f. establishing jurisdictional boundaries consistent with natural watersheds;
g. providing for citizen petition to remove board members;
h. providing for local control of implementation;
i. providing for the election of governing board members;
j. providing for election from single-member districts whose size is small enough to assure adequate representation;
k. providing for local establishment of standards more stringent than state or federal standards.

*Objectives are listed in order of priority as determined by citizen responses to a goals and objectives questionnaire. Please see Section III for a full explanation of the manner in which priorities were determined.

2. To provide for water pollution abatement and watershed management that encourages orderly growth by:

   a. *providing waste treatment facilities at the time development occurs;*
   b. *coordinating the location of new treatment facilities with other area authorities who perform planning functions;*
   c. *limiting the amount of new development to the assimilative capacity of the watershed;*
   d. *restoring and enhancing the capacity of streams to naturally assimilate biodegradable wastes;*
   e. *assuring that any land use measures necessary for an effective water quality management program be flexible;*
   f. *directing growth away from flood plains, areas experiencing land subsidence, ecologically fragile and unique areas, aquifer recharge zones, and drinking water supplies, and toward less sensitive areas;*
   g. *limiting pollutant discharges to the capacity of available waste treatment facilities.*

3. To establish financial incentives that encourage prompt, affirmative, and cost-effective steps on the part of public and private institutions to develop and maintain adequate water pollution abatement facilities, by:

   a. *providing an incentive program that is administered in such a manner that both the incentives and the administrative procedures are easily understood by the public and by the institutions involved;*
   b. *providing for fair distribution of the costs of pollution abatement facilities.*

4. To develop a point source pollution abatement program that includes:

   a. *achieving appropriate treatment of all discharges;*
   b. *reviewing and updating water quality standards regularly, based on the evaluation of progress toward goals;*
   c. *establishing and implementing techniques to monitor all discharges.*

5. To develop a nonpoint source pollution abatement program that includes:

   a. *protecting water resources from accidental discharges of oil and hazardous substances;*
   b. *reviewing and updating water quality standards regularly, based on the evaluation of progress toward goals;*
   c. *utilizing non-structural control methods wherever appropriate and feasible;*
   d. *protecting water resources from the effects of dredging;*
   e. *implementing controls on erosion;*
   f. *establishing a program to monitor nonpoint source pollution;*
   g. *implementing controls on pollution resulting from stormwater runoff.*

6. To provide for an active public education and information program on the effects of water pollution, the necessity of regulations, the goals of 208 water quality planning, and the benefits to be obtained from pollution control efforts. Such a program should include:

   a. identifying agency personnel with clear responsibilities for maintaining an adequate flow of information to the public;
   b. providing technical data for those citizens desiring that level of information;
   c. disseminating information through public education events and existing information centers dispersed throughout the area;
   d. providing information translated from technical documents into an understandable and meaningful form for citizens without technical expertise;
   e. publishing on a periodic basis documents listing pollution sources in order of magnitude and charts showing progress toward 208 water quality goals and objectives.

7. To promote a more efficient use of water resources by:

   a. encouraging water conservation;
   b. developing and utilizing water recycling techniques.

8. To coordinate the efforts to improve water quality in the 208 area with other environmental planning programs relating to air quality, solid waste disposal, flood plain management, coastal zone management, food and other agricultural concerns, and similar concerns in the Greater Houston and surrounding areas.